

Applicant : Henrik Glent-Madsen  
For : METHOD FOR ESTABLISHING A LIGHT BEAM WITH  
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In the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) Method for establishing a light beam ~~(CLB)~~ with substantially constant luminous intensity comprising the steps of
  - establishing a light beam ~~(LB)~~ by means of a light source ~~(SAL)~~ and
  - controlling an attenuation of said light beam ~~(LB)~~ on the basis of occurrences of luminous intensity peaks ~~(IP)~~ in said light beam ~~(LB)~~.
2. (currently amended) Method for establishing a light beam according to claim 1 whereby said luminous intensity peaks ~~(IP)~~ occur periodically.
3. (currently amended) Method for establishing a light beam according to claim 1 ~~or claim 2~~ whereby said luminous intensity peaks ~~(IP)~~ may at least within a particular time interval be considered of substantially equal magnitude.
4. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 3~~ claim 3 whereby said particular time interval is at least 50 hours, more preferably 200 hours and even more preferably 1000 hours.
5. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 4~~ claim 1 whereby said controlling an attenuation comprises applying a first level of attenuation to said light beam ~~(LB)~~ at times where the luminous intensity of said light beam assumes ~~the a~~ magnitude of an intensity floor ~~(IF)~~ and applying a further level of attenuation to the said light beam at times where luminous intensity peaks ~~(IP)~~ occur.
6. (currently amended) Method for establishing a light beam according to ~~any of the~~

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~~claims 1 to 5~~ claim 5 whereby said further level of attenuation is proportioned to the magnitude difference between said luminous intensity peaks ~~(P)~~ and said luminous intensity floor ~~(F)~~.

7. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 6~~ claim 1 whereby said attenuation is achieved by means of a variable attenuation means ~~(VAM)~~.

8. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 7~~ claim 7 whereby said variable attenuation means ~~(VAM)~~ is capable of applying at least two different levels of attenuation to said light beam ~~(LB)~~.

9. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 8~~ claim 8 whereby one of said at least two different levels of attenuation represents substantially no attenuation.

10. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 9~~ claim 9 whereby an attenuation control means ~~(ACM)~~ is coupled to said variable attenuation means ~~(VAM)~~.

11. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 10~~ claim 10 whereby said attenuation control means ~~(ACM)~~ controls which of said at least two different levels of attenuation that is applied to said light beam ~~(LB)~~ by means of an attenuation control signal ~~(ACS)~~.

12. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 11~~ claim 11 whereby said attenuation control means ~~(ACM)~~ is coupled to a lamp driver ~~(LD)~~ that drives said light source ~~(SAL)~~.

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13. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 12~~ claim 12 whereby said attenuation control means (ACM) controls ~~the~~ a timing of said luminous intensity peaks (IP) by means of a lamp driver control signal (LCS).

14. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 13~~ claim 12 whereby said attenuation control means (ACM) controls ~~the~~ a magnitude of said luminous intensity peaks (IP) by means of a lamp driver control signal (LCS).

15. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 14~~ claim 10 whereby said attenuation control means (ACM) receives a lamp driver reference signal (LRS) comprising information on properties of said luminous intensity peaks (IP).

16. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 15~~ claim 15 whereby said attenuation control means (ACM) controls which of said at least two different levels of attenuation that is applied to said light beam (LB) by means of said attenuation control signal (ACS) at least partly on the basis of said lamp driver reference signal (LRS).

17. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 16~~ claim 14 whereby said attenuation control means (ACM) receives an attenuation reference signal (ARS) comprising information on properties of said variable attenuation means (VAM).

18. (currently amended) Method for establishing a light beam according to ~~any of the~~

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claims 1 to 17 claim 17 whereby said attenuation control means (ACM) controls properties of said luminous intensity peaks (IP) by means of said lamp driver control signal (LCS) at least partly on the basis of said attenuation reference signal (ARS).

19. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 18~~ claim 13 whereby said attenuation control means (ACM) receives a light beam reference signal (BRS) derived from an intensity measuring device (BIM) adapted to measure the intensity of the light beam (LB).

20. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 19~~ claim 19 whereby said attenuation control means (ACM) receives a constant light beam reference signal (CRS) derived from an intensity measuring device (CIM) adapted to measure the intensity of said substantially constant intensity light beam (CLB).

21. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 20~~ claim 20 whereby said attenuation control means (ACM) controls properties of said luminous intensity peaks (IP) by means of said lamp driver control signal (LCS) at least partly on the basis of said light beam reference signal (BRS), said constant light beam reference signal (CRS) or a combination thereof.

22. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 21~~ claim 20 whereby said attenuation control means (ACM) controls which of said at least two different levels of attenuation that is applied to said light beam (LB) by means of said attenuation control signal (ACS) at least partly on the basis of said light beam reference signal (BRS), said constant light beam reference signal (CRS) or a combination thereof.

23. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 22~~ claim 12 whereby said attenuation control means (ACM) controls said variable attenuation means (VAM), said lamp driver (LD) or both at least partly on ~~the~~ a basis of

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predefined settings.

24. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 23~~ claim 12 whereby said attenuation control means (ACM) continuously controls said variable attenuation means (VAM), said lamp driver (LD), or both.

25. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 24~~ claim 10 whereby said attenuation control means (ACM) establishes a synchronization between ~~the~~ a timing of the application of said first and further levels of attenuation and the timing of said luminous intensity peaks (IP).

26. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 25~~ claim 15 whereby said variable attenuation means (VAM) is a ~~multilevel multi-level~~ variable attenuation means (MVAM).

27. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 26~~ claim 26 whereby said ~~multilevel multi-level~~ variable attenuation means (MVAM) is capable of applying infinite levels of attenuation to said light beam (LB).

28. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 27~~ claim 27 whereby said attenuation control means (ACM) controls which of said infinite levels of attenuation that said multilevel variable attenuation means (MVAM) applies to the light beam (LB) at least partly on the basis of ~~the~~ a magnitude difference between of the intensity peaks (IP) and the intensity floor (IF).

29. (currently amended) Method for establishing a light beam according to ~~any of the~~

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~~claims 1 to 28~~claim 28 whereby said attenuation control means (ACM) regulates which of said infinite levels of attenuation that said multilevel variable attenuation means (MVAM) applies to the light beam (LB) at least partly on the basis of feedback from a constant light beam intensity measuring device (CIM).

30. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 29~~claim 27 whereby said attenuation control means (ACM) controls which of said infinite levels of attenuation that said multilevel variable attenuation means (MVAM) applies to the light beam (LB) at least partly on the basis of user input.

31. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 30~~claim 27 whereby said attenuation control means (ACM) controls which of said infinite levels of attenuation that said multilevel variable attenuation means (MVAM) applies to the light beam (LB) at least partly on the basis of said lamp driver reference signal (LRS).

32. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 34~~claim 26 whereby said attenuation control means (ACM) controls which of said infinite levels of attenuation that said multilevel variable attenuation means (MVAM) applies to the light beam (LB) at least partly on the basis of ~~the~~an elapsed time of light source usage.

33. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 32~~claim 10 whereby said attenuation control means (ACM) promotes compensation for light beam property changes caused by prolonged use of said light source (SAL).

34. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 33~~claim 33 whereby said light beam property changes comprises intensity peak (IP) magnitude changes.

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35. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 34~~ claim 10 whereby said variable attenuation means (~~VAM~~) comprises a wheel (~~W~~) rotating around a centre of rotation (~~COR~~), said ~~centre~~ center of rotation being displaced from the ~~centre~~ center of a ~~cross section~~ cross section of said light beam (~~LB~~) in a direction perpendicular to the direction of said light beam, at least by a distance corresponding to the radius of said ~~cross section~~ cross section.
36. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 35~~ claim 35 whereby said wheel (~~W~~) comprises at least one transparent section (~~TS~~).
37. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 36~~ claim 35 whereby said wheel (~~W~~) comprises at least one cutout section (~~CS~~).
38. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 37~~ claim 35 whereby said wheel (~~W~~) comprises at least one ~~semitransparent~~ semi-transparent shaded section (~~SS~~).
39. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 38~~ claim 35 whereby said wheel (~~W~~) comprises at least one ~~semitransparent~~ semi-transparent raster section (~~RS~~).
40. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 39~~ claim 35 whereby said wheel (~~W~~) comprises at least one perforated section (~~PS~~).
41. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 40~~ claim 35 whereby said rotation of said wheel (~~W~~) is at least partly controlled by said attenuation control means (~~ACM~~).

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42. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 41~~ claim 35 whereby said wheel (W) comprises several semitransparent sections (SS1, SS2, SS3) each having different opacity.

43. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 42~~ claim 35 whereby said wheel (W) is displaceable in a direction perpendicular to the direction of said light beam (LB) by a user.

44. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 43~~ claim 35 whereby said wheel (W) is displaceable in a direction perpendicular to the direction of said light beam (LB) at least partly under control from said attenuation control means (ACM).

45. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 44~~ claim 7 whereby said variable attenuation means (VAM) comprises a diaphragm (DP) establishing an aperture AP of variable size.

46. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 45~~ claim 45 whereby said size of said aperture AP is at least partly controlled by said attenuation control means (ACM).

47. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 46~~ claim 7 whereby said variable attenuation means (VAM) comprises an opaque plate (OP) and mounting means (AR) allowing said opaque plate in a variable degree to obstruct said light beam.

48. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 47~~ claim 47 whereby said degree of obstruction is at least partly controlled by said attenuation control means (ACM).

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49. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 48~~ claim 10 whereby said variable attenuation means (VAM) comprises a displaceable sheet (SH), said displacement being allowed in a plane perpendicular to the direction of said light beam (LB).

50. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 49~~ claim 49 whereby said sheet (SH) comprises at least one transparent section (TS).

51. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 50~~ claim 49 whereby said sheet (SH) comprises at least one cutout section (CS).

52. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 51~~ claim 49 whereby said sheet (SH) comprises at least one semitransparent-semi-transparent shaded section (SS).

53. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 52~~ claim 49 whereby said sheet (SH) comprises at least one semitransparent-semi-transparent raster section (RS).

54. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 53~~ claim 49 whereby said sheet (SH) comprises at least one perforated section (PS).

55. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 54~~ claim 49 whereby said sheet (SH) comprises several semitransparent-semi-

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transparent sections (SS1, SS2, SS3) each having different opacity.

56. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 55~~ claim 49 whereby said displacement of said sheet (SH) is at least partly controlled by said attenuation control means (ACM).

57. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 56~~ claim 49 whereby said displacement of said sheet (SH) is at least partly controlled by a user.

58. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 57~~ claim 9 whereby said variable attenuation means (VAM) comprises at least one spatial light modulator (SLM).

59. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 58~~ claim 58 whereby said spatial light modulator (SLM) is of a magneto-optic type.

60. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 59~~ claim 58 whereby said spatial light modulator (SLM) is of an electro-optic type.

61. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 60~~ claim 58 whereby said spatial light modulator (SLM) is of an acousto-optic type.

62. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 64~~ claim 58 whereby said spatial light modulator (SLM) is a liquid crystal display.

63. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 62~~ claim 58 whereby said spatial light modulator (SLM) is a micro-mechanical shutter array.

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64. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 63~~ claim 58 whereby said spatial light modulator (SLM) is a DMD-modulator.

65. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 64~~ claim 58 whereby said spatial light modulator (SLM) is at least partly controlled by said attenuation control means (ACM).

66. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 65~~ claim 7 whereby said variable attenuation means (VAM) comprises at least one pivotally mounted mirror (PM) and at least one attenuation filter (AF).

67. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 66~~ claim 7 whereby said variable attenuation means (VAM) comprises means for changing ~~the~~ a direction of said light beam (LB).

68. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 67~~ claim 1 whereby the luminous intensity of said established light beam with substantially constant luminous intensity (CLB) is completely constant.

69. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 68~~ claim 1 whereby the luminous intensity of said established light beam with substantially constant luminous intensity (CLB) is constant within a tolerance of  $\pm 50\%$ , more preferable within a tolerance of  $10\%$ , and even more preferably within a tolerance of  $1\%$ .

70. (currently amended) Method for establishing a light beam according to ~~any of the~~

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claims 1 to 69 claim 69 whereby the luminous energy conducted by said established light beam with substantially constant luminous intensity ~~CLB~~ during one peaking period is within  $\pm 10\%$ , more preferable within  $\pm 5\%$ , and even more preferably within  $\pm 1\%$ , of the luminous energy conducted during a nominal period.

71. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 70~~ claim 1 whereby said light source ~~(SAL)~~ is a short arc lamp.

72. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 74~~ claim 12 whereby said lamp driver ~~(LD)~~ establishes an alternating current with current peaks ~~(CP)~~ for driving said light source ~~(SAL)~~.

73. (currently amended) Method for establishing a light beam according to ~~any of the claims 1 to 72~~ claim 12 whereby said lamp driver ~~(LD)~~ establishes a direct current with current peaks ~~(CP)~~ for driving said light source ~~(SAL)~~.

74. (currently amended) Use of the method according to ~~any of the claims 1 to 73~~ claim 1 in a light modulating arrangement used for photolithography.

75. (currently amended) Use of the method according to ~~any of the claims 1 to 74~~ claim 1 in a light modulating arrangement used for image projection.

76. (currently amended) An apparatus establishing a light beam ~~(CLB)~~ with substantially constant luminous intensity comprising comprising:  
a light source ~~(SAL)~~ establishing a light beam ~~(LB)~~,  
a variable attenuation means ~~(VAM)~~, and  
an attenuation control means ~~(ACM)~~;  
wherein said light beam is moderated into a light beam ~~(CLB)~~ with to have a substantially constant luminous intensity by means of the method according to ~~any of the claims 1 to~~

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| 73claim 1.